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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/896,439
Filing Date	June 29, 2001
First Named Inventor	Kenneth P. Wilson
Group Art Unit	1733
Examiner Name	B. Musser
Attorney Docket Number	2507-5761.1US

ENCLOSURES *(check all that apply)*

- ☒ Postcard receipt acknowledgment (attached to the front of this transmittal)
- ☒ Duplicate copy of this transmittal sheet in the event that additional filing fees are required under 37 C.F.R. § 1.16
- ☐ Preliminary Amendment
- ☐ Response to Restriction Requirement/Election of Species Requirement dated
- ☐ Amendment in response to office action dated
- ☐ Amendment under 37 C.F.R. § 1.116 in response to final office action dated
- ☐ Additional claims fee - Check No. in the amount of $
- ☐ Letter to Chief Draftsman and copy of FIGS. with changes made in red
- ☐ Transmittal of Formal Drawings
- ☐ Formal Drawings (sheets)
- ☐ Information Disclosure Statement, PTO/SB/08A; ☐ copy of cited references
- ☐ Supplemental Information Disclosure Statement; PTO/SB/08A; copy of cited references and Check No. in the amount of $180.00
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- ☐ Terminal Disclaimer
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  APPEAL BRIEF and Check no. 6813 in the amount of $340.00

Remarks

The Commissioner is authorized to charge any additional fees required but not submitted with any document or request requiring fee payment under 37 C.F.R. §§ 1.16 and 1.17 to Deposit Account 20-1469 during pendency of this application.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm *or* Individual name	Katherine A. Hamer Registration No. 47,628
Signature	Katherine A. Hamer
Date	October 21, 2004

CERTIFICATE OF MAILING

Express Mail Label Number: EV 348040642 US

Date of Deposit: October 21, 2004

Person Making Deposit: Leah Barrow

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Kenneth P. Wilson

Serial No.: 09/896,439

Filed: June 29, 2001

For: ROCKET ASSEMBLY ABLATIVE MATERIALS, AND METHOD FOR INSULATING OR THERMALLY PROTECTING A ROCKET ASSEMBLY

Confirmation No.: 8247

Examiner: B. Musser

Group Art Unit: 1733

Attorney Docket No.: 2507-5761.1US (21795-US-01)

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APPEAL BRIEF

Mail Stop Appeal Brief – Patent
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sirs:

This brief is submitted in the format required under 37 C.F.R. § 41.37(c). A check in the amount of $330.00 for the fee under 37 C.F.R. § 41.20(b)(2) for filing a brief in support of an appeal is enclosed.

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1) REAL PARTY IN INTEREST

The real party in interest in the present pending appeal is Alliant Techsystems Inc., Assignee of the pending application as recorded with the United States Patent and Trademark Office on June 29, 2001, at Reel 011977, Frame 0897.

2) RELATED APPEALS AND INTERFERENCES

The Appellant, the Appellant's representative, and the Assignee are not aware of any pending appeal or interference that would relate to, directly affect, be directly affected by, or have a bearing on the Board's decision in the pending appeal.

3) STATUS OF THE CLAIMS

Claims 1-20 are pending in the application.

Claims 1-20 stand rejected.

Claims 1-20 are the subject of the pending appeal.

4) STATUS OF AMENDMENTS

A Final Office Action ("Final Office Action") was mailed on June 2, 2004, in which claims 1-20 were rejected under 35 U.S.C. § 103(a). On August 3, 2004, Appellant filed an Amendment Under 37 C.F.R. § 1.116 ("Amendment After Final") in which claim 7 was amended to correct a typographical error. See Amendment After Final, p. 3. On September 9, 2004, an Advisory Action ("Advisory Action") was mailed in which the rejection of claims 1-20 was maintained. The Advisory Action also stated that the Appellant's reply had overcome "the

rejection of claim 7 over Binning *et al.*, the admitted prior art, and Lambdin Jr." Advisory Action, p. 2 and Advisory Action, p. 4 of the Attachment. Therefore, the rejection of claim 7 under this combination of cited references is not addressed herein. Appellant filed a Notice of Appeal on September 1, 2004.

5) SUMMARY OF THE CLAIMED SUBJECT MATTER

The presently claimed invention is directed to a method of insulating or thermally protecting a rocket motor assembly. See, the as-filed specification at p. 4, line 23 through p. 5, line 22. A precursor material of a rocket motor ablative material is formed from at least one aromatic polyamide and is formed into a reinforcement structure. *Id.* at p. 5, lines 6-11 and p. 6, lines 11-14. The aromatic polyamide is a poly(meta-arylaramid), such as poly(*m*-phenyleneisophthalamide). *Id.* at p. 6, lines 11-14. The precursor material includes aramid filaments or carded and spun aramid staple fibers, which are formed into a yarn having a denier per fiber ("dpf") ranging from 1.5 dpf to 3.0 dpf. *Id.* at p. 6, line 19 through p. 7, line 16. The precursor material is twisted, carded, or spun to form the yarn. *Id.* The yarn is patterned into a desired structure, such as by weaving, winding, or plying. *Id.* at p. 8, lines 23-25. Nonwoven processes may also be used to form a felt or flock structure. *Id.* at p. 8, lines 25-26. The structure formed from the precursor material is carbonized to form a reinforcement structure, which is impregnated with a resin to form the rocket motor ablative material. *Id.* at p. 9, lines 3-18. The rocket motor ablative material is used as an ablative material, bulk material, or insulation liner in a rocket motor assembly. *Id.* at p. 5, lines 6-11 and p. 9, line 19 through p. 10, line 1. The rocket motor ablative material is used as a chamber internal insulation liner, along a

flow path of a nozzle structure, or in a re-entry vehicle component. *Id.* at p. 5, lines 18-22 and p. 9, line 19 through p. 10, line 14.

6) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A.1. Claims 1-6 and 13-15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Admitted Prior Art in view of U.S. Patent No. 3,699,210 to Binning *et al.* ("Binning") and U.S. Patent No. 3,573,086 to Lambdin, Jr. ("Lambdin").

A.2. Claims 7-12 and 16-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Admitted Prior Art, Binning, and Lambdin and further in view of U.S. Patent No. 3,576,769 to Hirsch *et al.* ("Hirsch").

A.3. Claims 1-6 and 13-15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Binning in view of the Admitted Prior Art and Lambdin.

A.4. Claims 7-12 and 16-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Binning, the Admitted Prior Art, and Lambdin and further in view of Hirsch.

7) ARGUMENT

STANDARD OF PATENTABILITY UNDER 35 U.S.C. § 103(a)

The rejection of claims under 35 U.S.C. § 103(a) requires that the U.S. Patent and Trademark Office (the "Office") establish a *prima facie* case of obviousness. M.P.E.P. § 2142. M.P.E.P. 706.02(j) sets forth the standard for an obviousness rejection:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must

> be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

To provide a motivation or suggestion to combine, the prior art or the knowledge of a person of ordinary skill in the art must "suggest the desirability of the combination" or provide "an objective reason to combine the teachings of the references." M.P.E.P. § 2143.01. In addition, "it is fundamental that rejections under 35 U.S.C. § 103 must be based on evidence." *In re Lee*, 61 U.S.P.Q.2d 1430, 277 F.3d 1338, 1342 (Fed. Cir. 2002). This evidence "must be based on objective evidence of record." *Id.* at 1343. When patentability depends on a question of obviousness, "rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references" is "the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis." *Id.* This rigorous showing requires the Examiner to "explain the reasons one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious." *Id.* In other words, the motivation to combine can not "be resolved on subjective belief and unknown authority." *Id.* at 1344. Furthermore, the Examiner "cannot rely on conclusory statements when dealing with particular combinations of prior art and specific claims, but must set forth the rationale on which it relies." *Id.* at 1345.

It is also improper to combine references where the references teach away from combination. M.P.E.P. § 2145.

In view of this standard and the arguments set forth below, Appellant respectfully submits that the Office has not established a *prima facie* case of obviousness under 35 U.S.C. § 103(a).

A.1 REJECTION OF CLAIMS 1-6 AND 13-15 UNDER 35 U.S.C. § 103(a) OVER THE ADMITTED PRIOR ART IN VIEW OF BINNING AND LAMBDIN

In the Final Office Action, the Examiner rejected claims 1-6 and 13-15 under 35 U.S.C. § 103(a) as being unpatentable over the Admitted Prior Art in view of Binning and Lambdin.

Appellant respectfully submits that the obviousness rejection of claims 1-6 and 13-15 is improper and should be reversed because the cited references do not provide a motivation to combine to produce the claimed invention.

Independent claim 1 recites a method for insulating or thermally protecting a rocket motor assembly. The method comprises providing a precursor material comprising at least one aromatic polyamide. The precursor material has a dpf ranging from 1.5 dpf to 3.0 dpf. The precursor material is carbonized to form a reinforcement structure, which is impregnated with a resin matrix to form a rocket motor ablative material. The rocket motor ablative material is used on a portion of a rocket motor assembly.

The Admitted Prior Art teaches a rocket motor insulation that uses a viscose rayon as a precursor material. See, the as-filed specification of the instant application at p. 1, line 18 through p. 2, line 2. The viscose rayon is impregnated with a resin matrix, manipulated into a desired configuration, and carbonized to form a carbon structure. *Id.* The Admitted Prior Art does not teach the fineness or dpf of the viscose rayon or using an aromatic polyamide as the precursor material.

Binning teaches a method of carbonizing fibers, such as aromatic polyamide fibers. Column 1, lines 5-9 and lines 32-68. The fibers are first pretreated by heating at a temperature of 180°C-550°C in an oxygen-containing environment for an amount of time sufficient to blacken the fibers. Column 1, lines 55-58. The blackened fibers are then heated in a laser beam in a non-

oxidizing environment at a temperature from 700°C-1200°C for longer than one-tenth of a second to carbonize the fibers. Column 1, lines 58-61 and Column 3, lines 5-14. The carbon-based fibers are used in reinforced plastic composites, such as in ablative nose cones and rocket exhaust nozzles. Column 2, lines 1-5 and lines 37-41. The fibers are used with epoxy, phenolic, silicone, polyimide, or other resin systems. Column 2, lines 37-41. In addition to the aromatic polyamide fibers, Binning teaches that rayon fibers are used in its reinforced plastic composites. Column 3, lines 25-30. Binning does not teach the fineness of the fibers that are used.

Lambdin teaches an ablation-resistant structure having fibers of carbon or graphite that are bonded in a carbonized binder. Column 1, lines 14-16. The carbon or graphite fibers include cellulosic materials, such as rayon or cotton. Column 3, lines 25-27. Lambdin also teaches that rayon yarn having a denier of 2.29 is used to produce graphite fibers that are 10 mm in length and 5 mm in diameter. Column 3, lines 30-35. Lambdin does not teach or suggest that the fibers used in its ablation-resistant structure are formed from an aromatic polyamide.

As acknowledged by the Examiner, Binning does not teach the limitation in claim 1 of "providing a precursor material comprising at least one aromatic polyamide, the precursor material having a denier per fiber ranging from 1.5 denier per fiber to 3.0 denier per fiber" because Binning does not teach or suggest the denier of the fibers. Final Office Action, p. 3. The Examiner also acknowledges that the Admitted Prior Art does not teach or suggest this limitation because the Admitted Prior Art does not teach using an aromatic polyamide. *Id.* at p. 2-3. The Examiner states that "[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the rayon of the Admitted Prior Art with polyaramid since rayon is no longer available and since Binning et al. prefers polyaramid to rayon . . . and

particularly since Binning et al. discloses such material can be used in the same type of environment as applicant's." *Id.* at p. 2.

However, the Examiner's proposed motivation to combine the Admitted Prior Art and Binning is improper because it is based on conclusory statements. The fact that rayon is no longer available does not provide the requisite motivation to combine because nothing in the Admitted Prior Art or Binning suggests the desirability of, or provides an objective reason for, replacing the viscose rayon of the Admitted Prior Art with the aromatic polyamide fibers of Binning. The Examiner states "that the fact that rayon is no longer available . . . provides a motivation to look for an alternative to rayon." Advisory Action, p. 2. Assuming *arguendo* that this is true, the fact that rayon is no longer available does not provide the requisite motivation to use aromatic polyamides as the specific alternative to rayon. In addition, the fact that the aromatic polyamide fibers of Binning are preferred to rayon for preparing carbonized fibers does not provide a motivation to replace the viscose rayon in the Admitted Prior Art with aromatic polyamide fibers to produce the claimed invention. Furthermore, while Binning teaches that rayon is used, the rayon is used "in addition to the preferred . . . aromatic polyamide aforementioned." See Binning at column 3, lines 22-25. In other words, when rayon is used, the rayon is present in addition to the aromatic polyamides.

Furthermore, as acknowledged by the Examiner, even if the Admitted Prior Art and Binning were combined, the claimed invention would not be produced because the denier of the fibers would not be taught or suggested. Final Office Action, p. 3. Therefore, the Examiner relies on Lambdin as teaching the denier of the fibers. *Id.* The Examiner states that "[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to use 2.3

denier fiber to form the reinforcement since one in the art would use any conventional size fiber and Lambdin discloses this denier reinforcement has been used previously in carbonized impregnated fiber composites used in rocket nozzles." *Id.* However, the section of Lambdin (column 1, lines 35-40) relied upon by the Examiner in support of this assertion does not teach using this size of denier reinforcement in carbonized impregnated fiber composites that are used in rocket nozzles. Rather, the cited section of Lambdin teaches that "[h]igh-temperature applications such as space entry vehicles, rocket nozzles, combustion chamber liners, heat shields, etc., require structural materials which exhibit high strength, resistance to thermal shock, and good resistance to erosion by ablation." Lambdin at column 1, lines 35-40. Nothing in this cited section provides any teaching or suggestion for using a specific denier reinforcement in the carbonized impregnated fiber composites.

Furthermore, the denier reinforcement of Lambdin referred to by the Examiner is formed with a rayon material and not with an aromatic polyamide material. As such, Lambdin only teaches using a rayon yarn having a denier of 2.29. Lambdin does not teach using aromatic polyamide fibers in its ablation-resistant structure and, therefore, does not teach or suggest using aromatic polyamide fibers having the recited dpf. In addition, Lambdin provides no teaching or suggestion to utilize a 2.3 denier fiber of any type of fiber besides rayon, such as the types of fibers used in the reinforced plastic composites of Binning or in the carbon structure of the Admitted Prior Art.

In the Final Office Action, the Examiner also refers to United States Patent No. 4,830,845 to Ogawa *et al.* ("Ogawa") and United States Patent No. 3,635,675 to Ezekiel ("Ezekiel") as "show[ing] by a preponderance of the evidence using fiber sizes of 1.5-3 denier for carbonized

fibers for use in ablative materials." Final Office Action, p. 10. However, the pending claims have not been rejected over either of these two references. Furthermore, Ogawa is directed toward an acrylic fiber precursor having a fineness of 0.1 to 2.0 deniers while Ezekiel is directed toward a graphite fiber having a fineness of 1.2-2.1 deniers. Since neither of these references teaches or suggests using an aromatic polyamide, Ogawa and Ezekiel necessarily do not teach or suggest using an aromatic polyamide having the recited dpf. As such, these references do not cure the deficiencies in the Admitted Prior Art, Binning, and Lambdin.

In summary, since the Admitted Prior Art does not teach using an aromatic polyamide, the Admitted Prior Art necessarily does not suggest that the aromatic polyamide has the dpf recited in claim 1. While Binning teaches using an aromatic polyamide, Binning also does not suggest that the aromatic polyamide has a dpf ranging from 1.5 dpf to 3.0 dpf, as recited in claim 1. Finally, while Lambdin teaches a rayon yarn having the recited dpf, Lambdin does not suggest using an aromatic polyamide and, therefore, necessarily does not suggest the recited dpf of the aromatic polyamide. In addition, nothing in the Admitted Prior Art, Binning, and Lambdin, when combined, provides a motivation to combine to produce the claimed invention.

Since the cited references do not provide a motivation to combine, a *prima facie* case of the obviousness of claim 1 has not been established by the Office. As such, claim 1 is allowable.

If an independent claim is nonobvious, then any claim depending from the independent claim is also nonobvious. M.P.E.P. § 2143.03. Therefore, claims 2-6 and 13-15 are allowable as depending from an allowable base claim.

Appellant respectfully requests that the rejection of claims 1-6 and 13-15 under 35 U.S.C. § 103(a) be reversed.

A.2 REJECTION OF CLAIMS 7-12 AND 16-20 UNDER 35 U.S.C. § 103(a) OVER THE ADMITTED PRIOR ART, BINNING, AND LAMBDIN AND FURTHER IN VIEW OF HIRSCH

In the Final Action, the Examiner rejected claims 7-12 and 16-20 under 35 U.S.C. § 103(a) as being unpatentable over the Admitted Prior Art, Binning and Lambdin as applied to claim 1 above, and further in view of Hirsch.

Appellant submits that the obviousness rejection of claims 7-12 and 16-20 is improper and should be reversed because the cited references do not provide a motivation to combine to produce the claimed invention.

Independent claim 7 recites a method of insulating or thermally protecting a rocket motor assembly. The method comprises providing a precursor material comprising at least one poly(meta-arylaramid). The precursor material has a dpf ranging from 1.5 dpf to 3.0 dpf. A reinforcement structure comprising the precursor material is formed and is impregnated with a resin matrix to form a rocket motor ablative material. The rocket motor ablative material is used on a portion of a rocket motor assembly.

The teachings of the Admitted Prior Art, Binning, and Lambdin are as previously summarized.

Hirsch teaches a method of semicarbonizing an aromatic polyamide by exposing the aromatic polyamide to a moderate temperature over an extended time period. Column 2, lines 13-24. The aromatic polyamide is poly-m-phenylenebis(m-aminobenzamido)terphthalamide, the polyterephthalamide of 4, 4'-bis(4-aminobenzamido)diphenyl ether, poly-m-phenylene isophthalamide, poly-m-phenylenebis(m-aminobenzamido)-2,6-naphthylene dicarbonamide, poly-4,4'-diaminobenzanilide terephthalamide. Column 3, lines 6-13. To semicarbonize the

aromatic polyamide, the temperature is slowly raised from 25°C to 250°C or 500°C over a time period of 45-60 minutes. Column 2, lines 29-36. Hirsch teaches that exposing the aromatic polyamide to higher temperatures, such as temperatures required to carbonize the aromatic polyamide, causes products including the aromatic polyamide to become embrittled and weak. Column 2, lines 27-29. The products obtained by the method of Hirsch include semicarbonized aromatic polyamides and the properties of these products are distinguished from the properties of products produced by a carbonizing process. Column 2, lines 1-9.

As acknowledged by the Examiner, the Admitted Prior Art, Binning, and Lambdin do not teach the limitation in claim 7 of "providing a precursor material comprising at least one poly(meta-arylaramid), the precursor material having a denier per fiber ranging from 1.5 denier per fiber to 3.0 denier per fiber" because these references do not teach using a poly(meta-arylaramid). Final Office Action, p. 4. Therefore, the Examiner relies on Hirsch as teaching the use of the poly(meta-arylaramid). *Id.* The Examiner states that "[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to use any type of polyaramid such as NOMEX as the polyaramid in the Admitted Prior Art, Binning et al., and Lambdin, Jr. since Binning et al. discloses using polyaramids having phenylene which are not ortho and which have hydrogens as the pendant groups, and since Hirsch et al. shows that NOMEX is known in the art as a heat-resistant material (Abstract) and as a heat shield." *Id.*

However, nothing in the cited references, when combined, provides a motivation to combine to produce the claimed invention because the cited references do not suggest the desirability of, or provide an objective reason for, the combination. As previously discussed, the Admitted Prior Art does not teach using an aromatic polyaramide and, therefore, necessarily does

not teach using a poly(meta-arylaramid) or using a poly(meta-arylaramid) having the recited dpf. While Binning teaches using an aromatic polyamide, Binning does not teach or suggest that the aromatic polyamide is a poly(meta-arylaramid) having a dpf ranging from 1.5 dpf to 3.0 dpf. In addition, contrary to the Examiner's assertion, merely because Binning teaches using phenylenes that are not ortho does not render it obvious to use any polyaramid in the claimed invention. Furthermore, while Binning teaches using phenylenes that are not ortho, Binning provides no specific suggestion that a poly(meta-arylaramid) should be used and, therefore, provides no motivation to use a poly(meta-arylaramid). Contrary to the Examiner's assertion on p. 4 of the Advisory Action, Appellant is not arguing that Binning does not teach a meta-polyaramid. Rather, Appellant's argument is that Binning provides no specific suggestion to use a poly(meta-arylaramid) having the recited dpf. Furthermore, since Lambdin only teaches that its carbon or graphite fibers are rayon or cotton, Lambdin also does not teach using a poly(meta-arylaramid) as the precursor material. Therefore, Lambdin necessarily does not teach or suggest using the recited dpf of the poly(meta-arylaramid). Finally, while Hirsch teaches using a poly(meta-arylaramid), Hirsch does not suggest that the poly(meta-arylaramid) has a dpf ranging from 1.5 dpf to 3.0 dpf. As such, Hirsch does not cure the previously discussed deficiencies in the Admitted Prior Art, Binning, and Lambdin.

Hirsch also teaches away from combination with the Admitted Prior Art, Binning, and Lambdin because Hirsch teaches semicarbonizing (partially carbonizing) the aromatic polyamide fibers to produce aromatic polyamide fibers that are non-flammable, thermally stable, chemically inert, and exhibit good dimensional stability at elevated temperatures. See Hirsch at column 2, lines 13-19. In contrast, the Admitted Prior Art, Binning, and Lambdin teach carbonizing their

respective fibers. Hirsch also states that if the aromatic polyamide fibers are carbonized, rather than being semicarbonized, the aromatic polyamide fibers become weak and embrittled. Column 2, lines 27-29. Since the teachings of Hirsch relate to semicarbonizing the aromatic polyamide fibers and teach that carbonizing the aromatic polyamide fibers is undesirable, one of ordinary skill in the art would not be motivated to combine the Admitted Prior Art, Binning, and Lambdin with Hirsch to produce the claimed invention.

Since the cited references do not provide a motivation to combine, a *prima facie* case of obviousness of claim 7 has not been established by the Office. As such, claim 7 is allowable. Claims 8-12 and 16-20 are allowable as depending from an allowable base claim.

Appellant respectfully requests that the rejection of claims 7-12 and 16-20 under 35 U.S.C. § 103(a) be reversed.

A.3 REJECTION OF CLAIMS 1-6 AND 13-15 UNDER 35 U.S.C. § 103(a) OVER BINNING IN VIEW OF THE ADMITTED PRIOR ART AND LAMBDIN

In the Final Action, the Examiner rejected claims 1-6 and 13-15 under 35 U.S.C. § 103(a) as being unpatentable over Binning in view of the Admitted Prior Art and Lambdin. This rejection is substantially similar to the rejection of claims 1-6 and 13-15 in Section A.1 over the Admitted Prior Art in view of Binning and Lambdin, except that the Examiner is relying on a different primary reference. In other words, the same combination of references is used to reject the claims although the Examiner relies on a different primary reference.

As such, claims 1-6 and 13-15 are allowable for substantially the same reasons as discussed in Section A.1 above. Specifically, independent claim 1 is allowable because the cited references, when combined, do not provide a motivation to combine to produce the claimed

invention. Dependent claims 2-6 and 13-15 are allowable as depending from an allowable base claim.

Appellant respectfully requests that the rejection of claims 1-6 and 13-15 under 35 U.S.C. § 103(a) be reversed.

A.4 REJECTION OF CLAIMS 7-12 AND 16-20 UNDER 35 U.S.C. § 103(a) OVER BINNING, THE ADMITTED PRIOR ART, AND LAMBDIN AND FURTHER IN VIEW OF HIRSCH

In the Final Action, the Examiner rejected claims 7-12 and 16-20 under 35 U.S.C. § 103(a) as being unpatentable over Binning, the Admitted Prior Art and Lambdin as applied to claim 1 above and further in view of Hirsch. This rejection is substantially similar to the rejection of claims 7-12 and 16-20 in Section A.2 over the Admitted Prior Art, Binning, and Lambdin and further in view of Hirsch, except that the Examiner is relying on a different reference as the primary reference.

As such, claims 7-12 and 16-20 are allowable for substantially the same reasons as discussed in Section A.2 above. Specifically, independent claim 7 is allowable because the cited references, when combined, do not provide a motivation to combine to produce the claimed invention. Dependent claims 8-12 and 16-20 are allowable as depending from an allowable base claim.

As such, Appellant respectfully requests that the rejection of claims 7-12 and 16-20 under 35 U.S.C. § 103(a) be reversed.

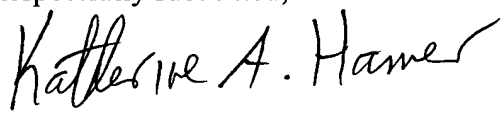
8) CLAIMS APPENDIX

A copy of claims 1-20 is appended hereto as "Appendix A."

CONCLUSION

Appellant respectfully submits that claims 1-20 are allowable over the cited references of record and respectfully requests that the rejections of claims 1-20 under 35 U.S.C. § 103(a) be reversed.

Respectfully submitted,



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Date: October 21, 2004
KAH/ljb
Document in ProLaw

APPENDIX A

Claims 1-20

U.S. Patent Application No. 09/896,439

Filed June 29, 2001

1. A method for insulating or thermally protecting a rocket motor assembly, comprising:

providing a precursor material comprising at least one aromatic polyamide, the precursor material having a denier per fiber ranging from 1.5 denier per fiber to 3.0 denier per fiber;

carbonizing the precursor material to form a reinforcement structure;

impregnating the reinforcement structure with a resin matrix to form a rocket motor ablative material; and

using the rocket motor ablative material on a portion of a rocket motor assembly.

2. The method of claim 1, wherein providing a precursor material comprising at least one aromatic polyamide comprises providing a precursor material comprising carded and yarn-spun staple aramid fibers.

3. The method of claim 1, wherein providing a precursor material comprising at least one aromatic polyamide comprises providing a precursor material comprising yarn-spun aramid filaments.

4. The method of claim 1, wherein providing a precursor material comprising at least one aromatic polyamide comprises providing a precursor material comprising at least one member selected from the group consisting of aramid felt and aramid flock.

5. The method of claim 1, wherein using the rocket motor ablative material on a portion of a rocket motor assembly comprises applying the rocket motor ablative material as a bulk ablative material of an exit nozzle liner.

6. The method of claim 1, wherein using the rocket motor ablative material on a portion of a rocket motor assembly comprises applying the rocket motor ablative material as a bulk ablative material of a reentry vehicle nose cone.

7. A method for insulating or thermally protecting a rocket motor assembly, comprising:

providing a precursor material comprising at least one poly(meta-arylaramid), the precursor material having a denier per fiber ranging from 1.5 denier per fiber to 3.0 denier per fiber;

forming a reinforcement structure comprising the precursor material;

impregnating the reinforcement structure with a resin matrix to form a rocket motor ablative material; and

using the rocket motor ablative material on a portion of a rocket motor assembly.

8. The method of claim 7, wherein forming a reinforcement structure comprising the precursor material comprises forming the reinforcement structure comprising carded and yarn-spun staple aramid fibers.

9. The method of claim 7, wherein forming a reinforcement structure comprising the

precursor material comprises forming the reinforcement structure comprising yarn-spun aramid filaments.

10. The method of claim 7, wherein forming a reinforcement structure comprising the precursor material comprises forming the reinforcement structure comprising at least one member selected from the group consisting of aramid felt and aramid flock.

11. The method of claim 7, wherein using the rocket motor ablative material on a portion of a rocket motor assembly comprises applying the rocket motor ablative material as a bulk ablative material of an exit nozzle liner.

12. The method of claim 7, wherein using the rocket motor ablative material on a portion of the rocket motor assembly comprises applying the rocket motor ablative material as a bulk ablative material of a reentry vehicle nose cone.

13. The method of claim 1, wherein providing a precursor material comprising at least one aromatic polyamide comprises forming the at least one aromatic polyamide into a yarn.

14. The method of claim 13, wherein providing a precursor material comprising at least one aromatic polyamide comprises structuring the yarn into a desired structure.

15. The method of claim 14, wherein providing a precursor material comprising at

least one aromatic polyamide comprises carbonizing the desired structure.

16. The method of claim 7, wherein forming a reinforcement structure comprising the precursor material comprises forming the at least one poly(meta-arylaramid) into a yarn.

17. The method of claim 16, wherein forming a reinforcement structure comprising the precursor material comprises structuring the yarn into a desired structure.

18. The method of claim 17, wherein forming a reinforcement structure comprising the precursor material comprises carbonizing the desired structure.

19. The method of claim 1, wherein providing a precursor material comprising at least one aromatic polyamide comprises providing a precursor material comprising poly(meta-phenyleneisophthalamide).

20. The method of claim 7, wherein providing a precursor material comprising at least one poly(meta-arylaramid) comprises providing a precursor material comprising poly(meta-phenyleneisophthalamide).